AquaTechnex

"Advancing the Science of Lake Management"

Hunts Point Eurasian Milfoil Control Program

2004 Monitoring Report

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Introduction and Project Overview

Lake Washington is located in King County, Washington. The lake is a 21,500 acre lake with a mean depth of 108 feet and a maximum depth of 214 feet. The lake has a drainage area of 472 square miles. The shoreline is a mix of residential and commercial areas.

Lake Washington has been affected by Eurasian milfoil (*Myriophyllum spicatum*) since the 1970's. Eurasian milfoil is an invasive aquatic plant species which negatively impacts many uses of a lake including boating, fishing and swimming. This invasive species will also rapidly replace native aquatic plants and form dense colonies impacting the above mentioned activities. This weed can also alter a number of water quality parameters critical to fish and wildlife. Milfoil is a state listed class B noxious aquatic weed.

Eurasian milfoil cannot grow without adequate light, thus deeper parts of Lake Washington do not support Eurasian milfoil growth. However, shallower parts of the lake, such as shoreline and coves, are conducive to milfoil growth. While eradication of milfoil in a lake as large as Lake Washington is not a realistic goal, it can be controlled in areas to non nuisance levels using a variety of methods.

The Town of Hunts Point has been involved in the management of this noxious weed in the waters of Cozy Cove and Fairweather Bay on Lake Washington for a number of years. These shallow coves are susceptible to Eurasian milfoil growth and have exhibited heavy infestations of this weed for years. The approach prior to 2003 has been to apply contact herbicides to provide relief to the shoreline residents. While these products provide short term relief from this weed, they do not impact the root crowns and regrowth does occur. In some cases this regrowth occurs during the same growing season depending on the timing of the treatment.

In 2002, the Town developed and adopted an Integrated Aquatic Vegetation Management Plan to focus Eurasian Milfoil management efforts. One of the key objectives identified was to attempt to restore the native aquatic plant communities in these bays by selectively suppressing the Eurasian Milfoil using 2,4-D based aquatic herbicides. The Town applied to the Washington Department of Ecology Freshwater Weed Fund to receive a grant to implement a

three year project with that objective. The grant request was approved and the program was implemented in the summer of 2003.

2,4-D based aquatic herbicides are selective for aquatic plants that are members of the dicot or broad leaf family. Many native aquatic plants such as elodea and potamogetons are monocots or members of the grass family. Eurasian Milfoil is one of the few broad leaf aquatic plant species. Milfoil is very susceptible to 2,4-D based herbicides while the native species present at low levels in these bays are not. The objective of this project is to use this herbicide to selectively target the Eurasian Milfoil and allow the native plants to recover into the space occupied by the Eurasian Milfoil.

The first application was performed in 2003 by Aquatechnex, LLC. Monitoring was performed by Jones and Stokes during the 2003 treatment season. Jones and Stokes submitted their monitoring report in the fall of 2003 (Jones and Stokes, 2003). The general conclusions were:

1. Aquatic plant biomass data and diver observations made both before and 30 days after treatment clearly indicate that where the herbicide 2,4-D was applied, control of Eurasian Milfoil appeared to be effective.
2. 2,4-D residue data was variable. This was attributed to two formulations of 2,4-D herbicide that were used (granular with a lower release rate and liquid) and the size of the treatment areas in each bay.
3. Dissolved oxygen (DO) levels decreased at all sites from July to August, but this decrease did not appear to be related to treatment since the non-treatment DO levels also declined (Washington Department of Ecology, 2003)

During the winter of 2003-2004, the Town chose to change consultants conducting the monitoring portion of the program primarily due to higher than expected fees in 2003 that severely depleted the monitoring budget. Aquatechnex, LLC took over the monitoring portion of this project for the summer of 2004.

Summary of 2,4-D Herbicide Application

The second year application of 2,4-D was made to areas of Cozy Cove and Fairweather Bay that exhibited Eurasian Milfoil growth on July 20, 2004. The amine form of this herbicide (Dow DMA 4 IVM) was used exclusively during the

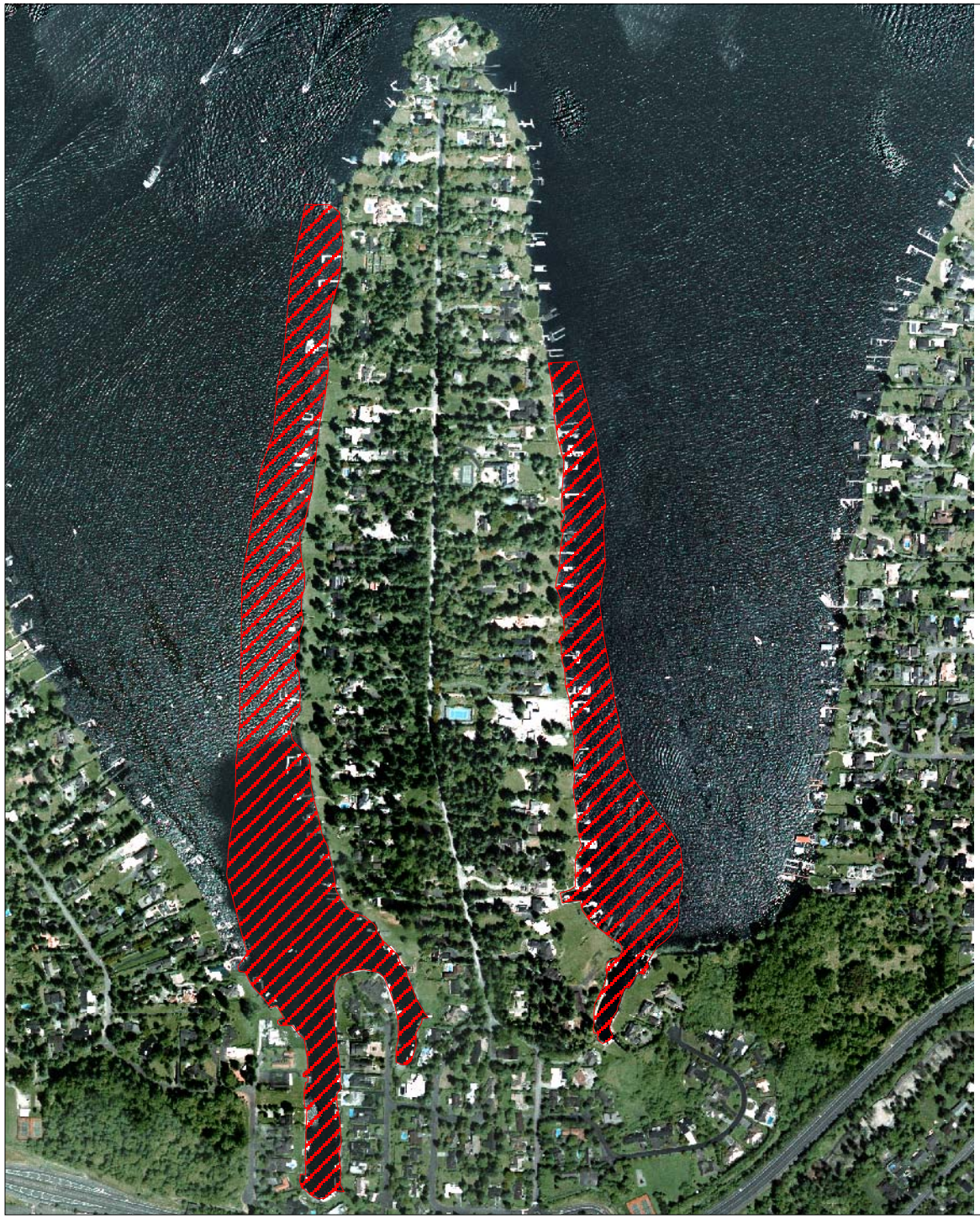
2004 season. During the winter of 2003-2004, a federal court judge ruled in the Washington Toxics Coalition vs. US Environmental Protection Agency case that EPA had not performed adequate consultation with the National Marine Fisheries Service on the potential impacts of pesticides on salmon listed under the Endanger Species Act (ESA). The ESA requires this consultation. While the judge established buffers where a number of pesticides including 2,4-D are not allowed until this consultation is completed, the judge allowed the use of the amine formulation of 2,4-D for noxious aquatic weed control. The granular formulation that had been used in previous years does not contain the amine form of this herbicide and can not be used in salmon bearing waters until the EPA completes the consultation process.

Prior to treatment, Aquatechnex staff applied for coverage under the National Pollution Discharge Elimination System (NPDES) permit for Noxious Aquatic Weed Control. This permit is required prior to the application of herbicides to Waters of the United States. Once permit coverage is obtained, the applicator performed the required public notification to the property owners as required.

The application of 2,4-D under the Noxious Aquatic Weed NPDES requires that the applicator file a notice of intent to treat with the regional biologist with the Washington Department of Fish and Wildlife, or utilize timing tables published by that agency. As the agency has specific timing tables for this section of Lake Washington, the treatment was performed using that document to select a treatment date.

Prior to treatment, Aquatechnex staff biologists performed an extensive aquatic plant survey of the treatment areas. Eurasian Milfoil was significantly reduced from the levels that were present pre-treatments in 2003. The team identified 48 acres within the 77 acres treated in 2003 that has Eurasian Milfoil present at some level. The application was made to those areas using weighted drop hoses from a GPS equipped treatment vessel. The target application rate was 1.5 gallons per acre foot to provide a estimated concentration of 1.2 mg/l in the treatment areas.

The treatment area map shows the location of the 48 acres that were treated during 2004. While there were aquatic plants present in the littoral areas north along both sides of the peninsula, there was no Eurasian Milfoil present at levels that supported the application of herbicide to those previously (2003) treated sites.



Hunts Point
2004 Eurasian Milfoil Control Map

Legend:

Control zones

N
W E
S

100 0 100 200 300 400 500 Meters

Overview of Environmental Monitoring

Aquatechnex biologists studied the Quality Assurance Project Plan developed by Jones and Stokes for the 2003 monitoring program prior to conducting environmental monitoring in 2004. There were a few modifications made to their methodology prior to implementation. This were primarily due to the severe limitations on the monitoring budget.

In the 2003 work, some of the biomass sampling sites and transects where divers did visual observations were located outside of the treatment area. This was a result of a mis-understanding on the part of that consultant team with respect to the scope of the treatment. Aquatechnex moved those sampling stations back into the actual treatment sites for 2004 to obtain a more clear picture of the actual results from the treatment. The transects that were used for visual observation and the limited number of photo points were replaced with a point collection survey that better characterized the littoral area within the treatment sites. As the water is especially clear in this area, an extensive boat visual survey was also used to document conditions. The GPS unit was used by the boat team to navigate a grid across the entire littoral treatment area from 2003 and plant observations were recorded in the data log. The primary objective of this project is to document the removal of Eurasian Milfoil from the treatment sites while allowing for the recovery of native aquatic plants.

Aquatic Plant Survey

The methods used in the 2004 summer's survey were designed to locate and document the remaining Eurasian Milfoil present and to update the maps of the native aquatic plant communities in Cozy Cove and Fairweather Bay.

The survey team used a Trimble GeoXT Differential Global Positioning System (DGPS) Receiver/data logger to support the points survey data collection mission. Prior to going into the field, a data dictionary was developed for this project. Using Trimble Pathfinder software, the Data Dictionary Editor function was used to build the Hunts Point Data Dictionary. The data dictionary was constructed with the following pull down menus for use in the field:

Eurasian Milfoil	Elodea	Coontail	Chara spp.	F Water Lily
Pot 1	Pot 2	Pot 3	Pot 4	No Plant

Default feature settings were established for each feature on the Trimble GeoXT. The logging interval was set for one second. This function directs the receiver to collect a GPS signal at one-second intervals. The accuracy default was set for "code". The default minimum number of positions collected for each feature was set for 10. Display symbols and colors for the symbols were also selected and set.

Pull down menus for plant density attributes were attached to each feature. The Pot 1-4 features were established because a number of Potamogeton species were expected to be encountered during the survey. As these species were not known prior to the survey, each label would be assigned in the field to a particular species as the team moved around the lake. If additional species are found, the data dictionary can be edited in the field to add the species names.

The data dictionary (file name Huntspoint.ddf) was then transferred to the Trimble GeoXT using the docking station and Pathfinder Data Transfer Utility. An image of Hunts Point was also transferred using this utility to provide a visual reference of the survey team's location on the lake. The Coordinate System used was UTM, zone 10 North and datum NAD 1983 (Conus).

The survey team also assembled the other necessary equipment to conduct the survey. This included SCUBA dive equipment, aquatic plant sample collection equipment, aquatic plant identification keys, underwater writing equipment and a data log book. The team was then ready to move into the water.

The first survey was performed on July 15, 2004. An Aquatechnex biologist and diver traveled to the lake, launched the mapping vessel and prepared for survey operations. The Trimble GeoXT was initialized and the Terrasync software used for data collection was opened. A rover file was created for this project (R071509B) and the data dictionary and background image were opened and made ready for use.

The point survey was performed first. The boat crew established a grid across Cozy Cove and Fairweather Bay using the GeoXT. At each survey point, the crew used a sampling rake and recorded all species present in the rake. The GeoXT GPS unit has a Windows CE computer built into the system. Terrasync software allows for the display of a background aerial image of the lake, the location of the

unit geographically referenced to the image and any data features collected. The boat operator used this view to navigate to the collection point. At the collection point, a sampling rake was thrown twice and retrieved. A double sided rake was used with a 50 foot rope. When the rake was retrieved, the species present were noted. Using the GeoXT and Terrasync software, a plant feature GPS point was stored at the sampling location. Species attributes were then recorded for that point. The data logging system was set up to have five pull down menus with the species selection so that five species attributes could be established for each sampling point. The survey team recorded a species attribute for each species found at that point with the stylus from this menu selection.

Pre and Post Treatment Biomass Sampling: Pre and post treatment biomass sampling was performed to assess the efficacy of the herbicide treatment on in Cozy Cove and Fairweather Bay. Ten sampling points were randomly selected within the treatment areas as required by the quality assurance plan. Sampling methodology developed by the Washington Department of Ecology (Parsons, 2001) were used to collect pre and post treatment biomass samples.

The pre treatment biomass survey took place on July 15, 2004 and the post treatment survey was conducted on August 25, 2004. The ten randomly selected points in Cozy Cove and Fairweather Bay were navigated to by using a Garmin GPS unit. Two sampling point (located near Jones and Stokes 2003 sites) were used in Yarrow Bay to serve as a reference plot.

Once at the sampling point a diver deployed a 0.25m2 quadrant and cut all the aquatic vegetation within the quadrant. The plants were then taken to the boat. The plant species found at each point were recorded in a field log book and samples were place in pre labeled ziplock bags, taken back to a lab, dried, weighed and recorded.

Water Quality Samples

Water quality samples were taken to obtain information regarding the breakdown of 2,4-D. 2,4-D is the active ingredient in the herbicide used to treat the Eurasian Milfoil in Fairweather Bay and Cozy Cove. Samples were taken from sample point one in Fairweather Bay and from sample point 10 in Cozy Cove. A Van Dorn instrument was used to collect samples and samples were taken approximately three feet below the surface. Samples were labeled according to location, date, and time and placed in an ice filled cooler. They were then shipped to Edge Analytical in Burlington, WA and analyzed for 2,4-D

using EPA method 8151A. A baseline sample was taken pre treatment and post treatment samples were taken at 1, 3 and 5 day intervals.

Water Quality Profiling

Water quality profiling was conducted to monitor potential changes to water quality before and after herbicide application. A Yellow Springs Instrument model 55d was used to conduct all water quality profiles. Profiling was conducted at all ten sample points at three depths within the water column in Fairweather Bay and Cozy Cove and the two sites in Yarrow Bay. Samples were taken just below the surface, the approximate mid- point of the water column and one foot above the lake bottom. Parameters measured included temperature (c) and dissolved oxygen (mg/l). A baseline water quality profile was conducted one hour pre treatment and post treatment profiles were conducted at 1, 3 and 5 day intervals.

Results and Discussion

Aquatic Plant Survey

There were two components to the aquatic plant survey, point survey results and pre and post treatment biomass results.

The point sampling survey was conducted on July 15th. This survey focused on the 77 acre treatment area from 2003. There were a total of 30 sampling locations surveyed as displayed on the Survey Points Map in Appendix A. The areas between the sampling points were visually inspected by the biologists and they noted the condition and species of plants present generally.

The survey team found a number of native and noxious aquatic weeds species at these locations. The following table presents the species present and collected at these data point. Also included in the table are statistics on the frequency of occurrence at all collection points.

Table One, Aquatic Plant Species Point Sampling Survey Results

Scientific Name	Common Name	Number of Points Collected	Percent of Points
Elodea canadensis	Elodea	19 of 30 points samples	63%
Potamogeton foliosus	Leafy Pondweed	17 of 30 points sampled	57%
Myriophyllum spicatum	Eurasian Milfoil	15 of 30 points sampled	50%
Potamogeton Illinoensis	Illinois Pondweed	13 of 30 points sampled	43%
Ceratophyllum demersum	Coontail	13 of 30 points	43%
Potamogeton Crispus	Curly Leaf Pondweed	8 of 30 points sampled	27 %
Potamogeton nodosus	Longleaf Pondweed	7 of 30 points sampled	23%
Potamogeton amplifolious	Big Leaf Pondweed	4 of 30 points sampled	13%
No Plants		4 of 30 points surveyed	13%
Egeria densa	Brazilian Elodea	4 of 30 points sampled	13%
Chara sp.	Chara	3 of 30 points sampled	10%
Najas Sp.	Slender Water-nymph	3 of 30 points sampled	10%

Appendix A contains a point map for each of these species.

The table lists the various aquatic plants detected by frequency of occurrence at a sampling site. The most common species sampled was elodea, followed by Leafy Pondweed. The target species for this project, Eurasian Milfoil, was found at only 50 percent of the sampling sites. Illinois Pondweed and Coontail were the next most common species detected. Curly Leaf Pondweed was found at 27% of the sites in this survey. This plant has recently been added to the state noxious weed list. Long Leaf and Big Leaf Pondweeds were the next most abundant

species present. The noxious aquatic weed Brazilian Elodea was found at four of these sites, located in both of the bays sampled. Chara and Slender Water-nymph round out the species collected in this sampling process.

The Eurasian Milfoil point map documents that this species is present in the southern inshore areas of the two bays. The team did not observe any significant amounts of this noxious weed north of the points displayed on this map. In the southern portions of each cove, Eurasian Milfoil dominated the plant communities in some cases making up 90 percent of the community pre treatment. The areas north of the last point recorded on both sides of the peninsula for milfoil had a few scattered plants present for a short distance. The 2004 Eurasian Milfoil Control Map outlines the treatment area for this season. This area is the only areas where Eurasian Milfoil was observed. The littoral areas north of the treatment zone as mapped did have extensive amounts of Eurasian Milfoil present in 2003 and these areas were treated that year. It was not necessary to treat these areas in 2004 because of this lack of the target weed.

It appears as though there was good carry over from 2003 in those areas. The carryover was less obvious in the more southern bay areas. This could be a result of the extensive amount of plant fragments that drift into and collect in this area throughout the year and especially in the fall. After being subject to a systemic herbicide for two treatment years, it is expected that further reductions in the milfoil populations will be made as a result of this year's treatment.

It will be crucial to target the Brazilian Elodea and potentially the Curly Leaf Pondweed in future years to insure these species do not expand to problem levels.

Aquatic Plant Biomass Data

Aquatic plant biomass was collected on July 15th to document pre treatment conditions at 10 sampling sites in the treatment area and two references sites in Yarrow Bay well removed from the treatment area. An additional collection at each of these sites approximately 30 days post treatment was also performed. The Sampling Point Map provides a visual location for each of these data collection points.

Table 2: Aquatic Plant Biomass Data

Sample ID	Pre Treatment Total Dry Biomass (g/ 0.25 m. sq)	Percent Eurasian Milfoil	Post Treatment Total Dry Biomass (g/0.25 m. sq)	Percent Eurasian Milfoil	Percent Eurasian Milfoil Control
S.P. 1	986	95	0	0	100
S.P. 2	862	65	267	0	100
S.P. 3	1062	85	0	0	100
S.P. 4	493	0	592	0	100
S.P. 5	268	0	338	0	100
S.P. 6	254	0	273	0	100
S.P. 7	397	25	410	0	100
S.P. 8	732	85	124	10	10
S.P. 9	496	75	62	5	5
S.P. 10	290	90	35	0	100
Yarrow 1	648	75	715	85	n/a
Yarrow 2	512	75	532	79	n/a

The biomass data clearly reflects visual observations made throughout the treatment area on August 25th. Visual inspection performed by boat within the treatment areas on August 25th showed that Eurasian Milfoil has been successfully removed from the treatment area. While there were small amounts present in a few of the biomass samples, milfoil plants were visually very hard to find at little more than 30 days post treatment.

After two years of treatment, data collection and analysis the following conclusions are offered.

- Eurasian Milfoil plants within the treatment areas were dramatically impacted by the 2,4-D treatment during both summer seasons. The size of the treatment area was reduced from 77 acres in 2003 to 48 acres in 2004 because some areas were free from Eurasian Milfoil after the 2003 treatment.

- Eurasian Milfoil was not the most dominant plant collected in a point sampling survey of the 2003 treatment area. There were two species of native plants that were more abundant as shown in table one.
- At the pre-treatment point in 2004, there was significant amounts of Eurasian Milfoil present in the back (southern) ends of both bays. The plant communities transitioned to one dominated by native aquatic plant species closer to the mouth of the bays to more milfoil dominated near the back of the bays. Some areas (as displayed on the 2004 treatment map) around the north end of the point did not have any significant amounts of Eurasian Milfoil present and there was no need to treat those areas. The presence of milfoil dominating the back end of each bay may be a result of the fragment drift into these areas from the rest of the lake. These areas are a natural catch for floating debris.
- There is a trend toward increased littoral area supporting native plant communities and a reduction in the littoral areas supporting Eurasian Milfoil within the treatment areas.
- There is good species diversity present in this section of the lake with 8 native aquatic plant species present.
- There are two other plants listed on the state noxious weed list that have been discovered as a result of this survey. *Egeria densa* (Brazilian elodea) was discovered at a few locations in both bays. This weed is on the Washington State Noxious Weed List and should be monitored. *Potamogeton crispus* (Curly Leaf Pondweed) was added to the State Noxious Weed List in November of 2004 as a class C weed. This plant can also become problematic and should be monitored.

Herbicide Residue Data

Water samples were collected and analyzed for 2,4-D at two locations, one in each bay. The water samples were collected at S.P. 1 in Fairweather Bay and S.P. 10 in Cozy Cove. These samples were collected pre-treatment (July 20th prior to treatment), one day post treatment (July 21st), three days post treatment (July 23rd and five days post treatment (July 26th). The results were provided by an WA DOE certified laboratory, Edge Analytical in Burlington, Washington. (Data sheets from the laboratory are attached in appendix B)

Table 3; 2,4-D Residue Data in ug/l

Sample Event	Sample Date	Station SP 1 Fairweather Bay	Station SP 10 Cozy Cove
Pre-treat	7-20-04	ND	n/a
One Day Post	7-21-04	1650	5580
One Day Post (Duplicate)	7-21-04	1740	n/a
Three Day Post	7-23-04	1228	731
Five Day Post	7-26-04	319	88

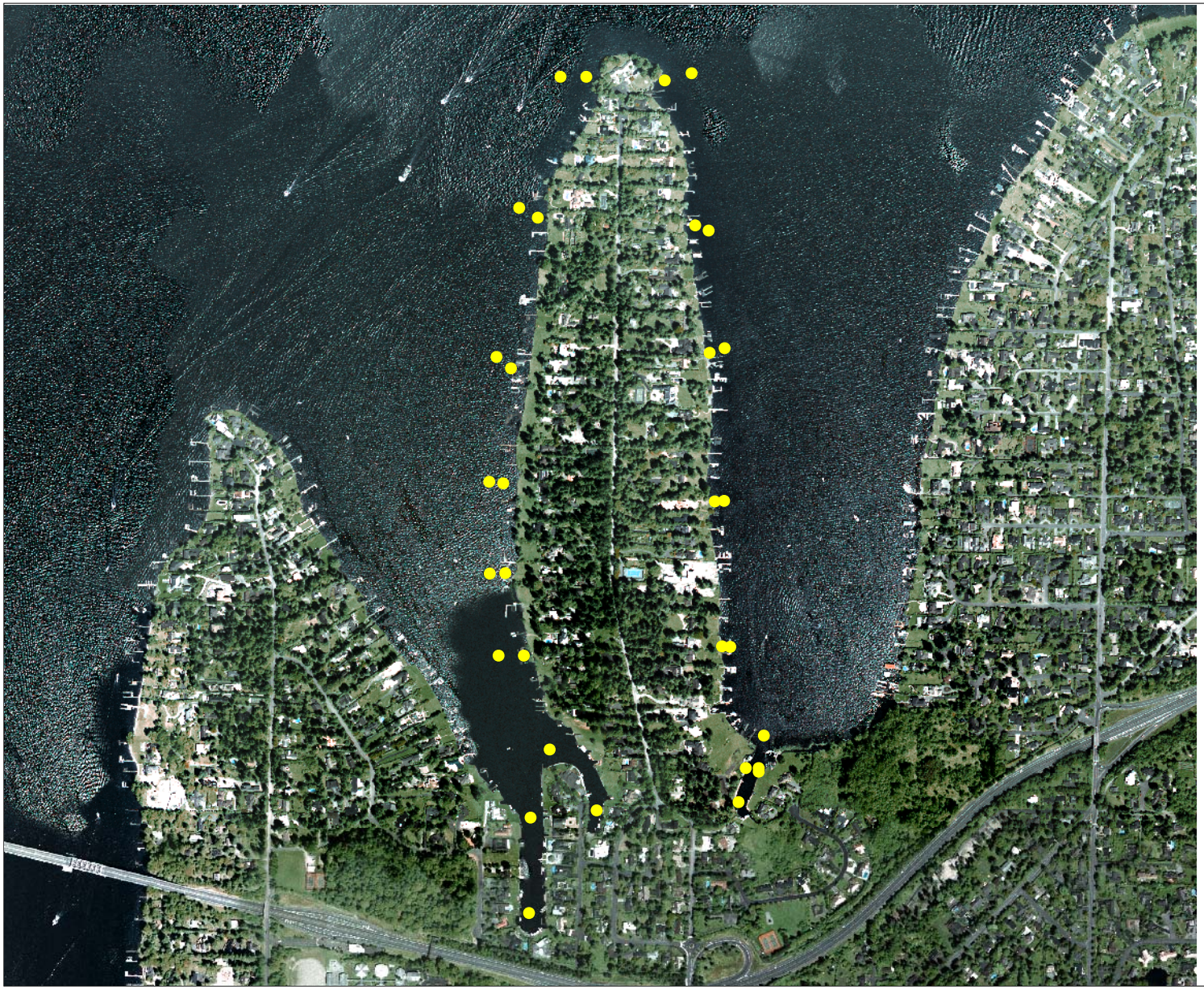
Station SP 1 and SP 10 are located at the sites noted on the aquatic plant biomass sampling map. One sample was collected pre treatment at SP 1. Three samples were collected one day post treatment, and two samples were collected at 3 and 5 days post treatment. The herbicide levels dropped as expected over the course of the five day monitoring program. The initial reading one day post treatment in the Cozy Cove site was a bit higher than expected. This may be a result of the sheltered location of the sampling site and lake currents. As happened last year, the herbicide levels in the more protected Fairweather Bay site declined as a slower rate than the more open Cozy Cove site.

Water Quality Profile

Water quality data was also collected at each of the 10 biomass sampling stations within the treatment area and the two Yarrow Bay reference stations pre and post treatment. This data was collected pre treatment (July 20th prior to application), one day post treatment (July 21st), three days post treatment (July 23rd), five day post treatment (July 26th) and 35 days post treatment (August 25).

The results were similar to the 2003 survey work. There was a slight decline in dissolved oxygen levels between the months of July and August. The data sheets for this phase of the project are located in Appendix C.

Appendix A
Aquatic Plant Sampling Maps
Point Sampling Locations and Species Maps
Biomass Sampling Locations



Hunts Point 2004 Plant Survey

Survey Points

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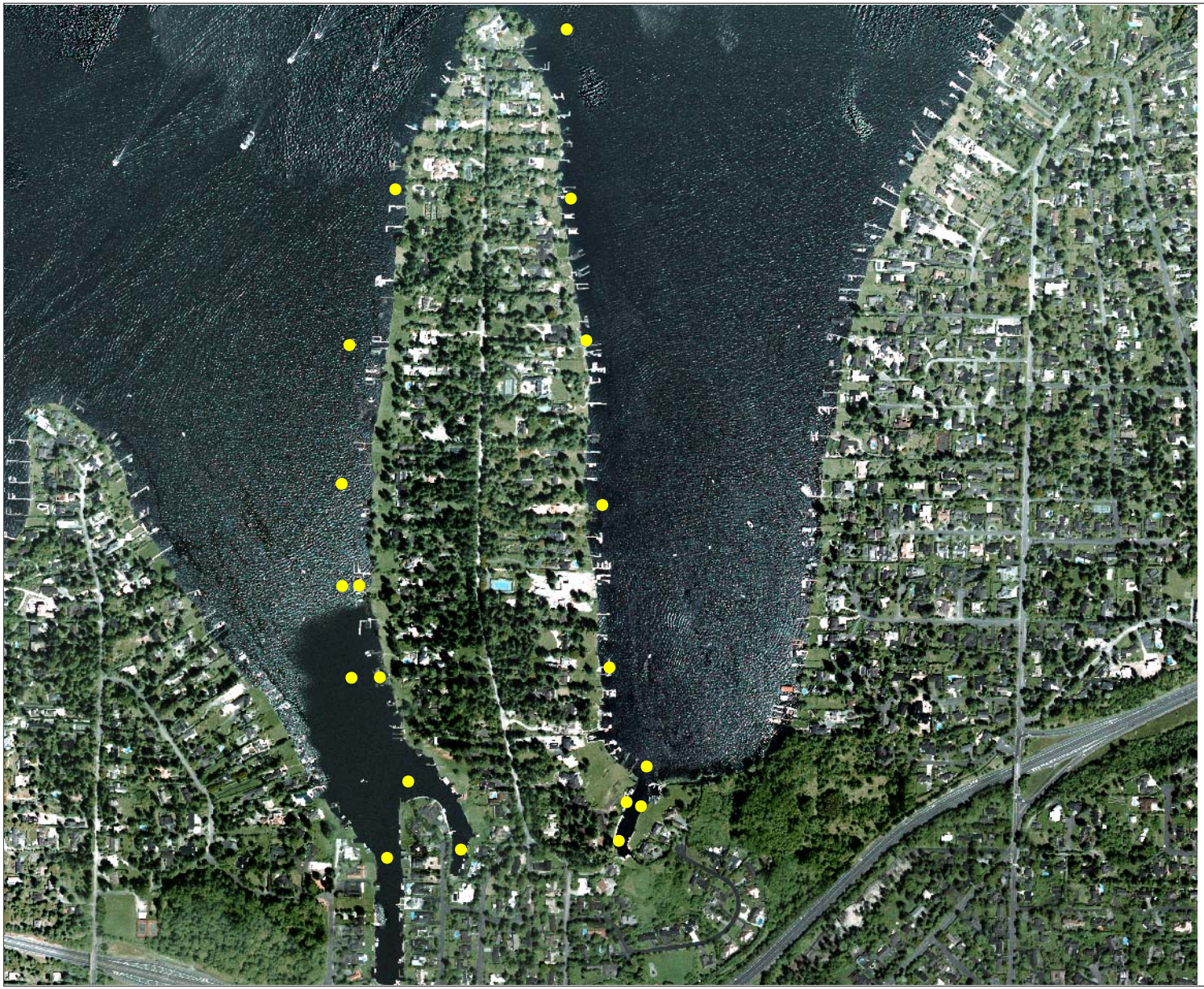

Hunts Point 2004 Plant Survey

Elodea canadensis

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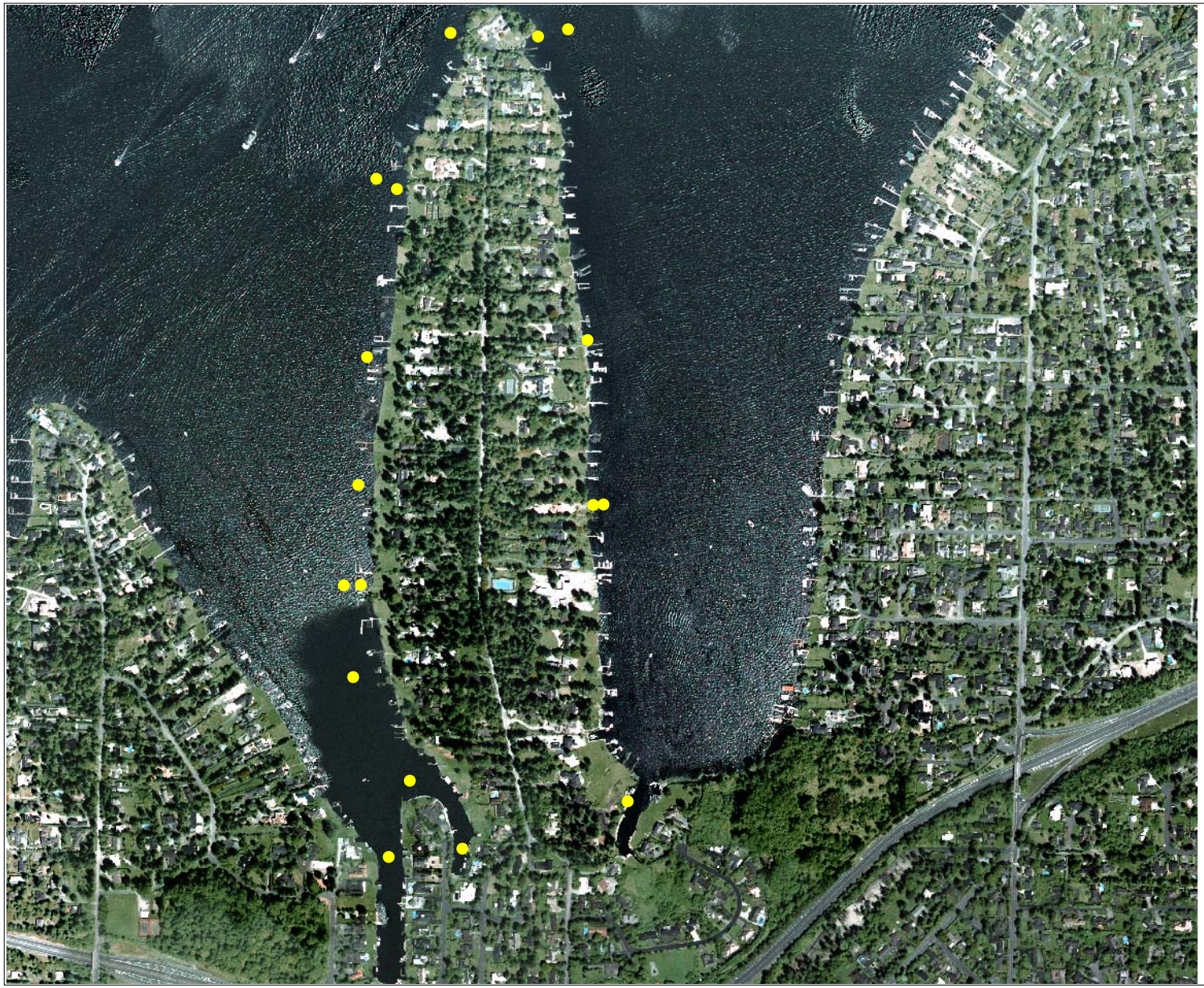

Hunts Point 2004 Plant Survey

- P. foliosus

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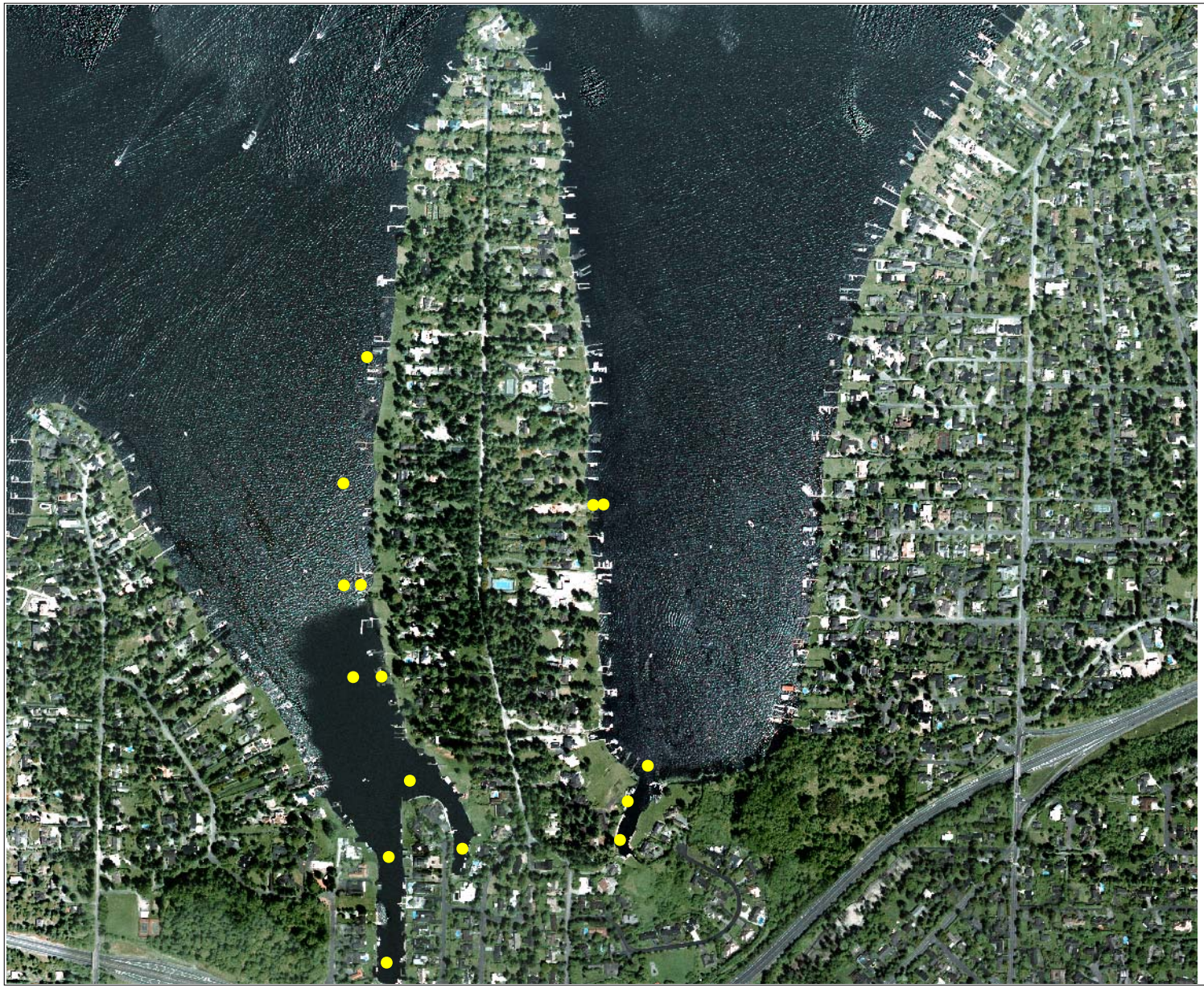

Hunts Point 2004 Plant Survey

Myriophyllum spicatum

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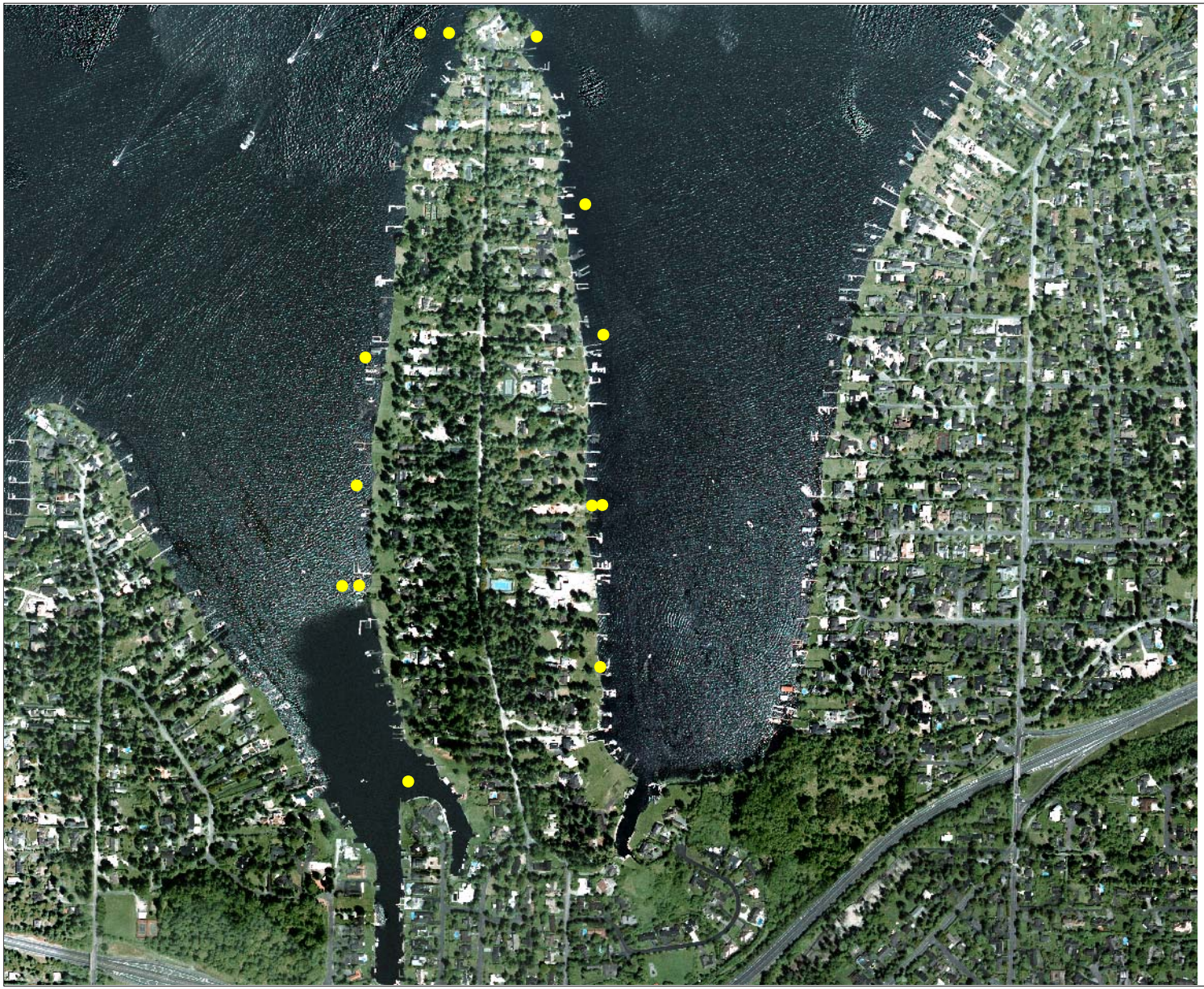

Hunts Point 2004 Plant Survey

- P. Illinoensis

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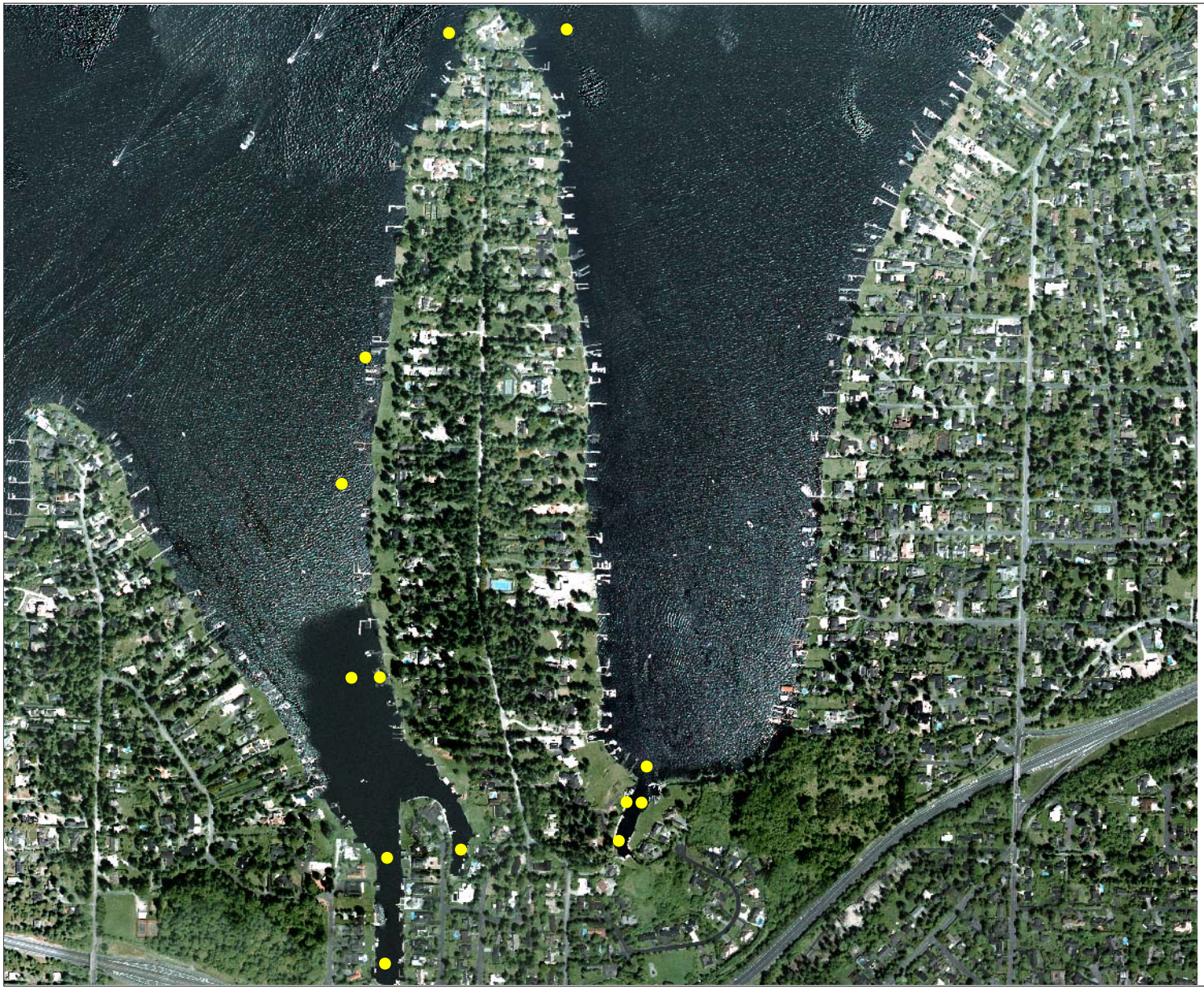

Hunts Point 2004 Plant Survey

Ceratophyllum demersum

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500 0 500 Meters

Hunts Point 2004 Plant Survey

P. crispus

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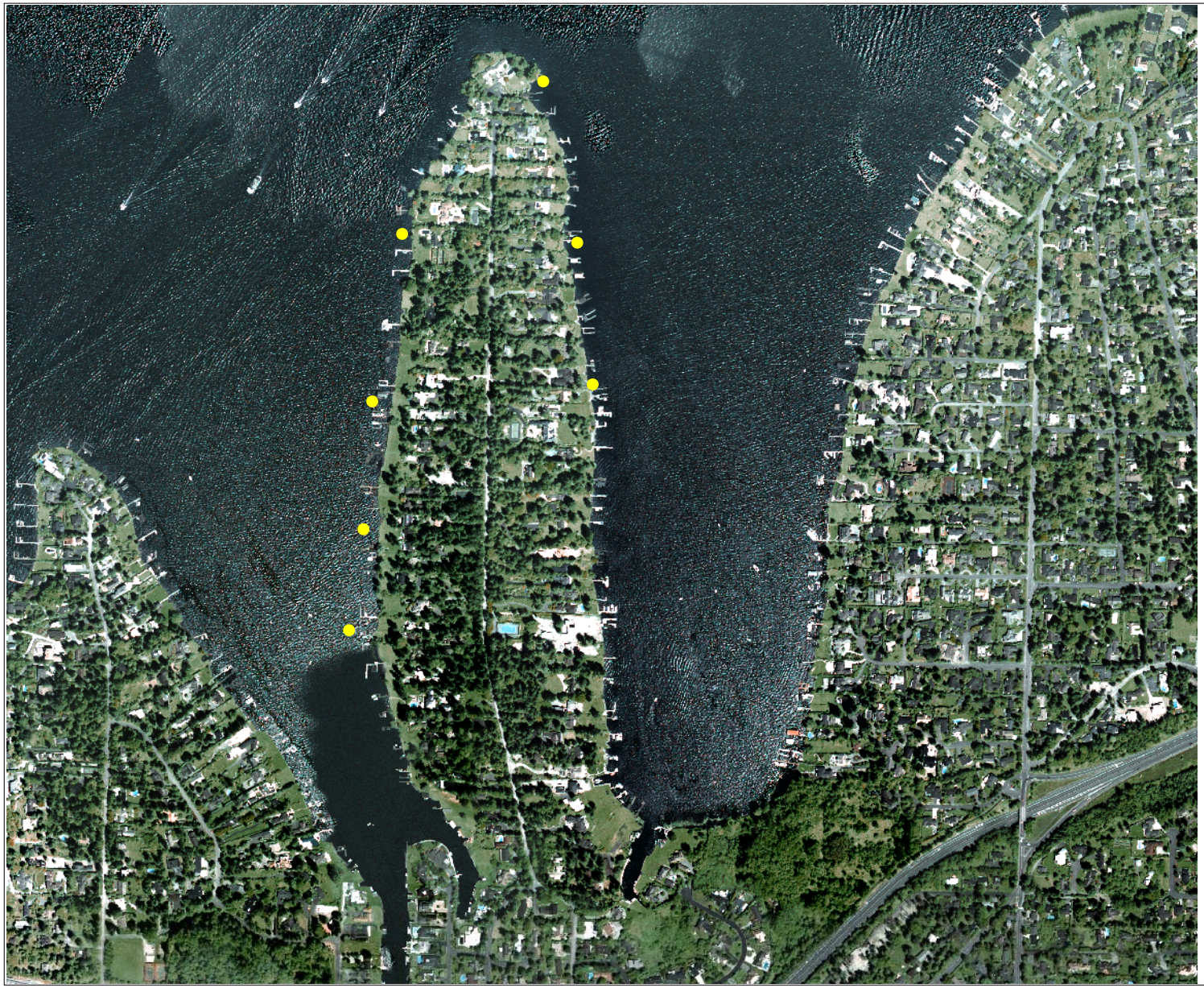

Hunts Point 2004 Plant Survey

- P. nodosus

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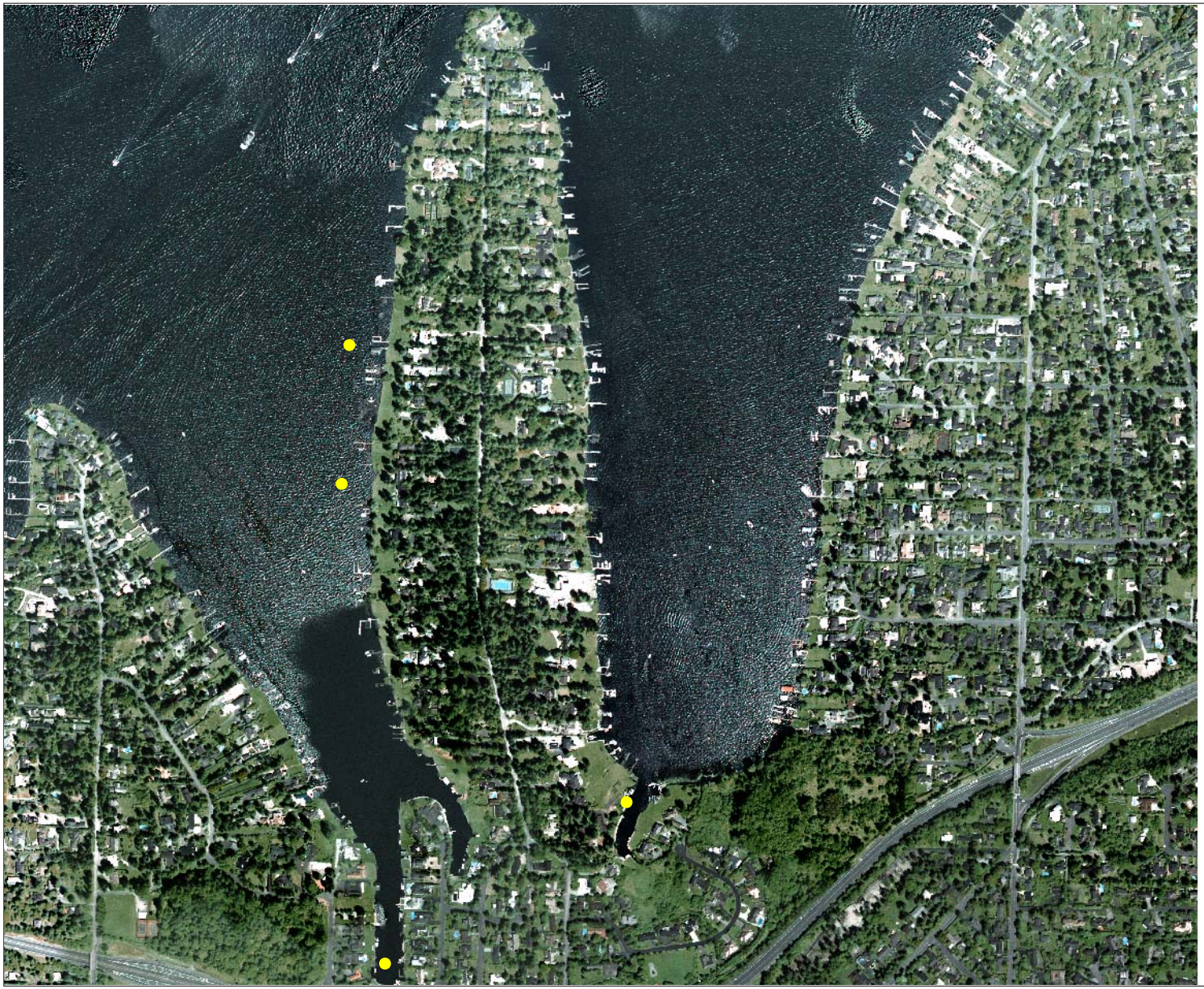

Hunts Point 2004 Plant Survey

- P. amplifolius

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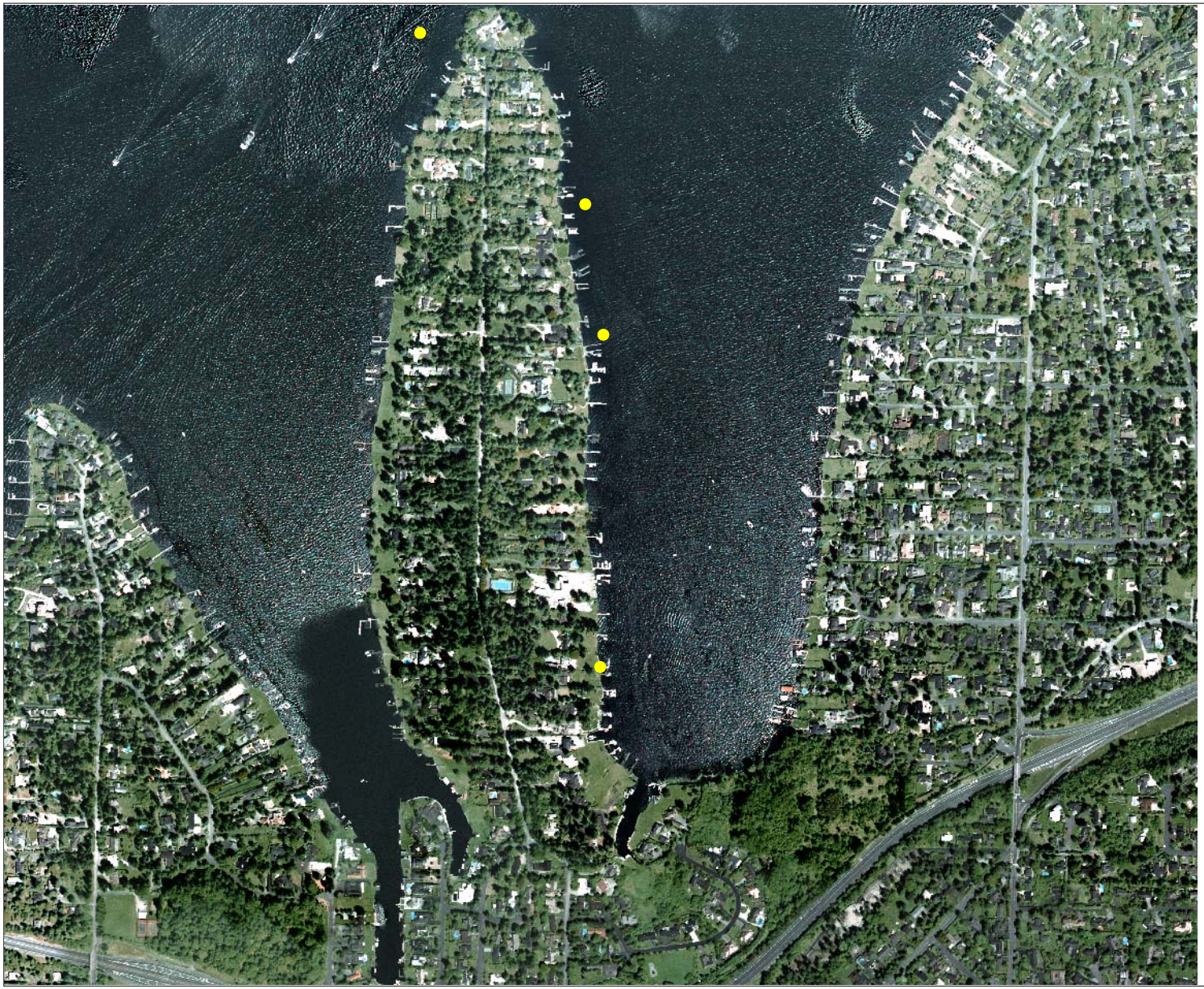

Hunts Point 2004 Plant Survey

● No Plants

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N
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500 0 500 Meters

Hunts Point 2004 Plant Survey

● Egeria densa

AquaTechnex
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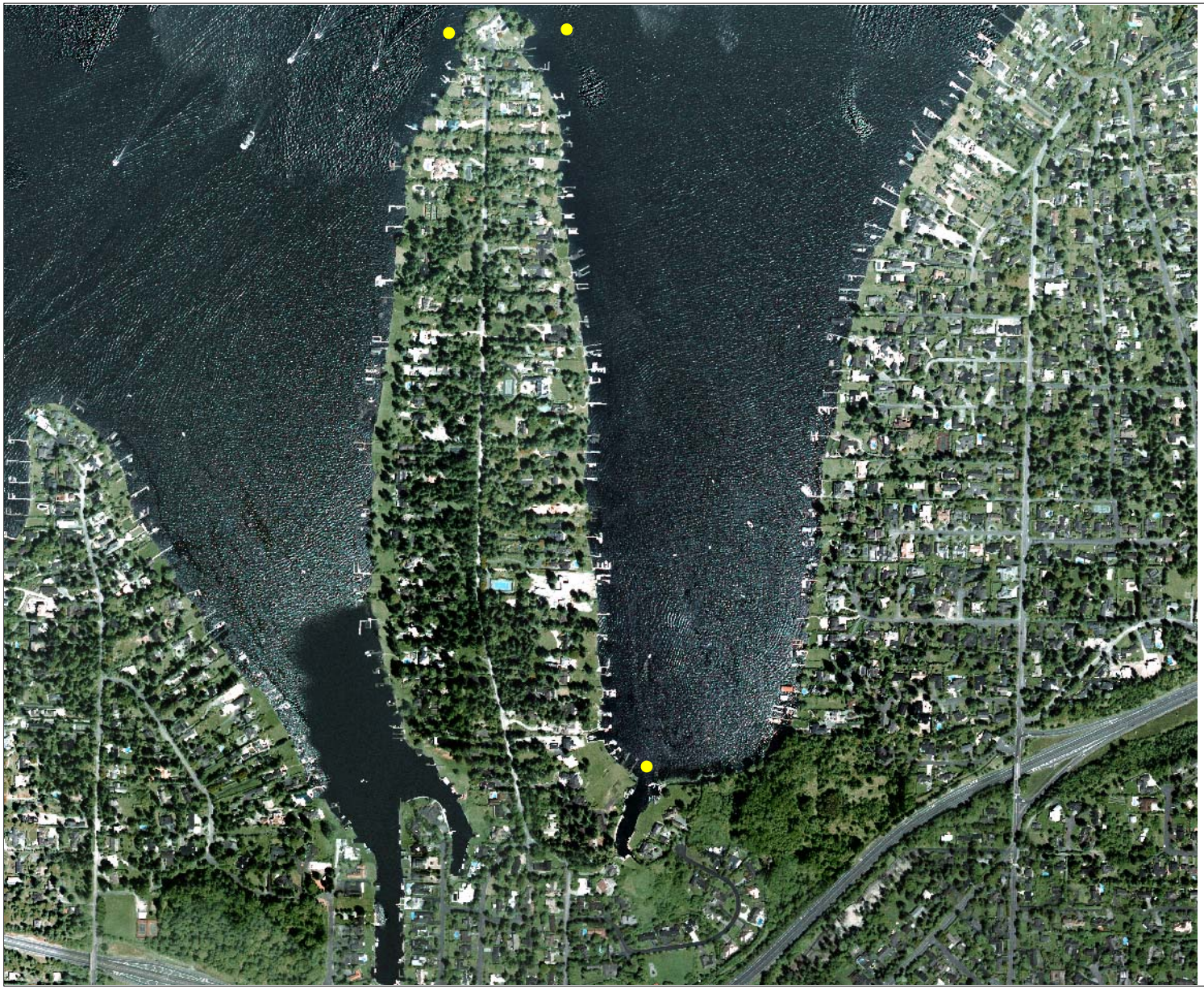

Hunts Point 2004 Plant Survey

Chara

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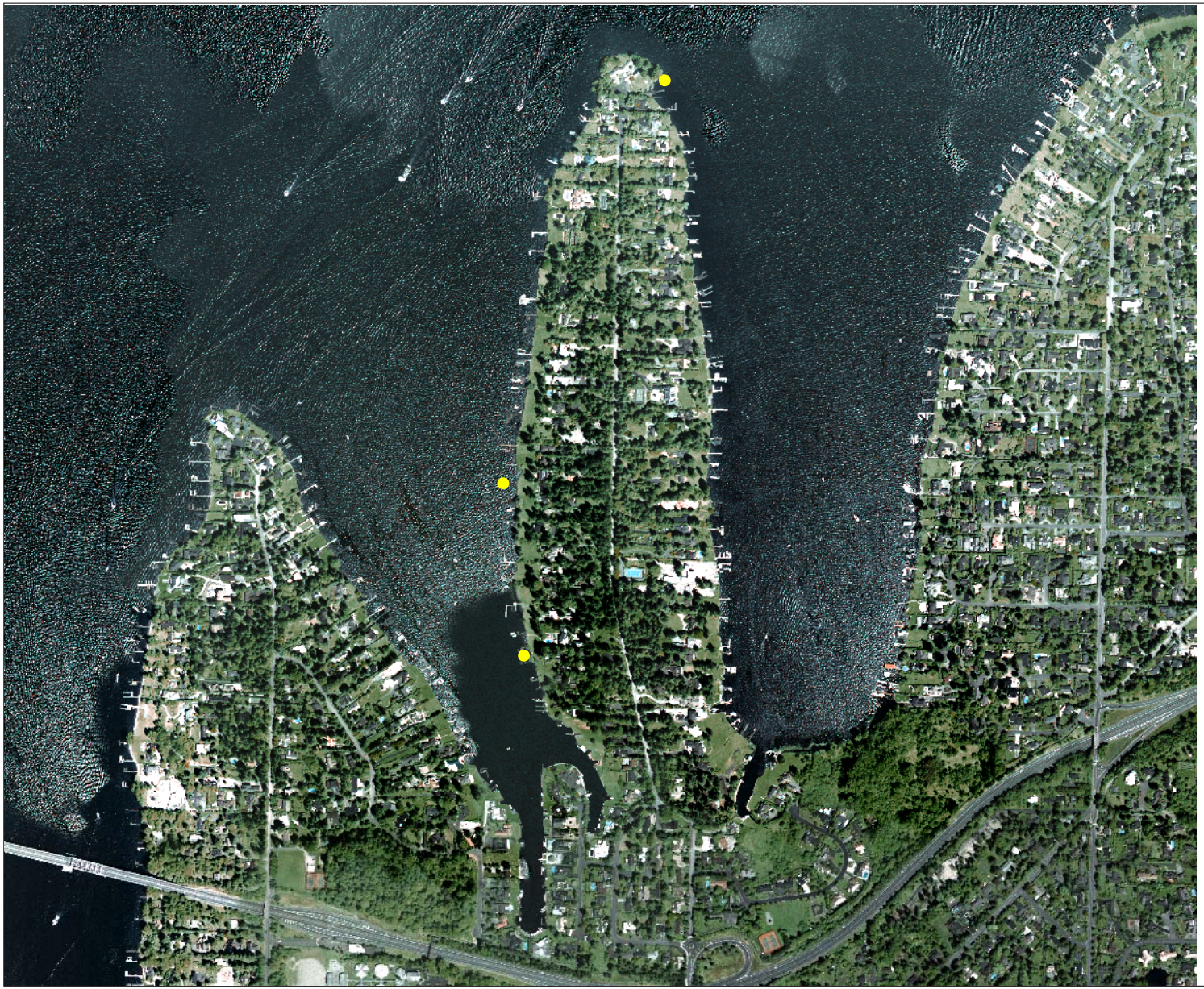

Hunts Point 2004 Plant Survey

● Najas spp.

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N
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500 0 500 Meters

Appendix B
Edge Analytical Laboratory's
Herbicide Residue Results

Appendix C
Water Quality Data Sheets

Pre Treatment Profiles

Date	Time	I.D.	D.O. (mg/l)	Temp. (c)	Depth (ft.)
7-20-04	10:31	S.P. 1	8.43	24.2	1
			9.58	23.7	3
			9.95	23.5	6
7-20-04	11:15	S.P.2	8.61	23.8	1
			9.07	23.6	3
			9.49	23.3	6
7-20-04	11:31	S.P. 3	7.54	24.0	1
			7.45	23.7	3
			8.29	23.2	6
7-20-04	11:47	S.P. 4	8.45	23.3	1
			8.15	23.3	3
			7.70	23.0	6
7-20-04	11:52	S.P 5	8.74	23.1	1
			8.32	22.7	6.5
			8.40	22.5	13
7-20-04	12:05	S.P. 6	8.67	22.7	1
			8.95	22.5	10
			5.85	22.4	20
7-20-04	12:17	S.P. 7	8.46	23.8	1
			8.25	22.8	3
			8.55	22.5	6
7-20-04	12:23	S.P. 8	8.00	22.8	1
			7.78	22.7	2.5
			7.61	22.7	5
7-20-04	12:30	S.P. 9	7.90	23.2	1
			7.83	23.0	2.5
			7.19	22.4	5
7-20-04	12:36	S.P. 10	7.75	23.2	1
			9.20	22.7	3.5
			6.08	22.4	7
7-20-04	12:45	Yarrow 1	9.3	23.1	1
			9.1	22.7	3
			7.5	22.3	6
7-20-04	12:52	Yarrow 2	8.6	23.2	1
			8.5	23.1	3
			7.9	22.9	6

Water Quality Profiles (One day Post Treatment)

Date	Time	I.D.	D.O. (mg/l)	Temp. (c)	Depth (ft.)
7-21-04	10:25	S.P. 1	9.44	23.4	1
			9.43	23.4	3
			8.68	23.2	6
7-21-04	10:33	S.P. 2	9.89	23.2	1
			9.81	23.2	3
			9.58	23.0	6
7-21-04	10:39	S.P. 3	8.71	23.3	1
			8.63	23.1	3
			7.86	22.9	6
7-21-04	10:47	S.P.4	8.84	23.0	1
			8.92	22.8	3
			8.76	22.7	6
7-21-04	10:52	S.P. 5	8.56	22.7	1
			8.65	22.5	6.5
			8.59	22.2	13
7-21-04	11:05	S.P. 6	8.52	23.0	1
			8.63	22.7	10
			8.83	22.2	20
7-21-04	11:12	S.P. 7	8.49	23.3	1
			8.48	23.1	3
			8.53	22.7	6
7-21-04	11:20	S.P. 8	7.74	22.9	1
			7.86	22.8	2.5
			7.47	22.6	5
7-21-04	11:24	S.P. 9	7.55	22.8	1
			7.55	22.7	2.5
			7.19	22.3	5
7-21-04	11:28	S.P. 10)	7.74	23.0	1
			7.71	23.0	3.5
			7.33	22.3	7
7-21-04	11:43	Yarrow 1	9.2	23.1	1
			9.1	22.7	3
			7.6	22.3	6
7-21-04	12:05 pm	Yarrow 2	8.5	23.2	1
			8.5	23.1	3
			7.7	22.8	6

Water Quality Profiles (Three Days Post Treatment)

Date	Time	I.D.	D.O. (mg/l)	Temp (c)	Depth (ft.)
7-23-04	9:02	S.P. 1	8.58	24.6	1
			8.43	24.5	3
			8.58	24.4	6
7-23-04	9:09	S.P.2	8.83	24.5	1
			8.68	24.5	3
			8.58	24.4	6
7-23-04	9:19	S.P. 3	8.07	24.5	1
			7.89	24.5	3
			7.36	24.3	6
7-23-04	9:27	S.P. 4	9.77	24.0	1
			9.89	24.0	3
			8.85	23.9	6
7-23-04	9:35	S.P. 5	8.85	23.7	1
			8.87	22.7	6.5
			8.64	22.4	13
7-23-04	9:49	S.P. 6	8.63	23.4	1
			8.83	23.0	10
			8.94	21.5	20
7-23-04	9:55	S.P. 7	8.06	23.8	1
			8.23	23.3	3
			8.45	23.1	6
7-23-04	10:01	S.P. 8	7.07	24.3	1
			6.89	24.4	2.5
			6.53	24.0	5
7-23-04	10:07	S.P. 9	7.06	24.6	1
			7.03	24.4	2.5
			6.40	24.1	5
7-23-04	10:13	S.P. 10	7.13	24.7	1
			7.10	24.3	3.5
			5.22	23.9	7
7-23-04	10:30	Yarrow 1	9.5	23.2	1
			9.1	22.7	3
			8.1	22.0	6
7-23-04	10:38	Yarrow 2	8.9	23.2	1
			8.5	23.1	3
			7.8	22.8	6

Water Quality Profiles (Five Days Post Treatment)

Date	Time	I.D.	D.O. (mg/l)	Temp (c)	Depth (ft.)
7-26-04	10:21	S.P. 1	7.00	24.7	1
			7.02	24.7	3
			7.46	24.7	6
7-26-04	10:28	S.P. 2	8.85	24.7	1
			9.15	24.6	3
			9.65	24.4	6
7-26-04	10:33	S.P. 3	7.05	24.7	1
			6.51	24.6	3
			6.54	24.5	6
7-26-04	10:44	S.P. 4	9.48	23.8	1
			9.15	23.7	3
			9.33	23.6	6
7-26-04	10:48	S.P. 5	8.51	23.4	1
			8.63	23.3	6.5
			8.88	23.0	13
7-26-04	11:01	S.P. 6	8.35	23.5	1
			8.44	23.0	10
			8.34	22.9	20
7-26-04	11:08	S.P. 7	8.10	23.6	1
			8.22	23.2	3
			8.29	23.0	6
7-26-04	11:15	S.P. 8	7.70	23.7	1
			7.56	23.3	2.5
			7.65	23.2	5
7-26-04	11:19	S.P. 9	6.43	23.6	1
			6.60	23.3	2.5
			5.37	23.1	5
7-26-04	11:25	S.P. 10	6.43	23.9	1
			5.89	23.5	3.5
			5.76	23.2	7
7-26-04	11:38	Yarrow 1	9.0	23.1	1
			9.1	22.5	3
			7.9	22.3	6
7-26-04	11:48	Yarrow 2	8.4	23.2	1
			8.5	23.1	3
			7.9	22.9	6

Water Quality Profiles (August 25, 2004)

Date	Time	I.D.	D.O. (mg/l)	Temp (c)	Depth (ft.)
7-26-04	10:21	S.P. 1	7.9	24.9	1
			7.5	24.9	3
			7.1	24.9	6
7-26-04	10:28	S.P. 2	8.3	24.6	1
			8.6	24.6	3
			8.4	24.4	6
7-26-04	10:33	S.P. 3	7.0	24.7	1
			6.5	24.6	3
			6.3	24.5	6
7-26-04	10:44	S.P. 4	8.7	24.8	1
			7.5	24.6	3
			7.1	24.7	6
7-26-04	10:48	S.P. 5	8.0	24.6	1
			7.5	24.7	6.5
			7.5	24.1	13
7-26-04	11:01	S.P. 6	8.3	23.5	1
			8.0	23.0	10
			8.3	22.9	20
7-26-04	11:08	S.P. 7	8.2	23.6	1
			8.1	23.2	3
			7.5	23.6	6
7-26-04	11:15	S.P. 8	7.0	24.6	1
			7.5	24.5	2.5
			7.1	24.3	5
7-26-04	11:19	S.P. 9	6.8	24.9	1
			6.5	24.6	2.5
			6.0	24.1	5
7-26-04	11:25	S.P. 10	6.5	24.5	1
			6.5	24.6	3.5
			6.0	24.1	7
7-26-04	11:38	Yarrow 1	8.0	24.8	1
			8.0	24.6	3
			7.6	24.5	6
7-26-04	11:48	Yarrow 2	7.1	24.2	1
			7.2	24.2	3
			7.0	24.0	6